Application No. 09/989,714
Filed: November 20, 2001
TC Art Unit: 2673
Confirmation No.: 9578

AMENDMENT TO THE CLAIMS

1. (Original) An optical sensor assembly for tracking movement of a surface comprising:

a target comprising said surface movably mounted to present a varying segment of said surface to a focus area; and

an optical sensor comprising a sensing component, said sensing component mounted facing said surface of said target at said focus area, wherein said optical sensor detects a change in position of said surface.

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2. (Original) The optical assembly of claim 1 wherein said optical sensor is positioned substantially beneath said surface.

3. (Original) The optical assembly of claim 1 wherein said target is cylindrical, said optical sensor is aligned placing said focus area perpendicular to a longitudinal axis of said cylinder and said surface is the circumferential surface of said cylinder.

4. (Original) The optical assembly of claim 3 wherein said cylinder has a diameter greater than approximately 8mm.

5. (Original) The optical assembly of claim 4 wherein said cylinder has a diameter between approximately 8mm and 12mm.

6. (Original) The optical assembly of claim 3 wherein said surface tracked by said optical sensor is textured.

7. (Original) The optical assembly of claim 1 wherein said surface is adapted to move vertically and the response of said optical sensor is substantially invariant to said vertical motion.

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8. (Original) The optical assembly of claim 7 wherein said optical sensor is positioned perpendicular to and beneath said surface.

9. (Original) The optical assembly of claim 7 further comprising a switch disposed beneath a portion of said surface, wherein said vertical movement of said surface activates said switch.

10. (Original) A mouse replacement device comprising said optical assembly of claim 1 and a rollerbar having a left end and a mounting end, wherein said rollerbar is adapted to traverse a left travel distance and an activation distance, and said focus area is located at approximately the sum of two times said left travel distance plus said activation distance from said left end of said roller bar.

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11. (Original) The mouse replacement device of claim 10 wherein said rollerbar has a first portion having a shiny hard surface and a second portion having a textured surface, said sensing component focused on said second portion.

12. (Withdrawn) A rollerbar mechanism for use in a cursor positioning device incorporating a sensor, said rollerbar mechanism comprising:

a horizontal base to support said rollerbar mechanism adjacent to a computer keyboard;

an elongated metal rod supported at one end by a mount that positions said elongated metal rod;

a sleeve terminated with bearings enclosing and resting on said rod, said sleeve rotatable around said rod and translatable along said rod, wherein said rotation and translation of said sleeve is interpretable by said sensor; and

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an end cap at an end of said rod distal from said mount, said end cap floating on a support.

13. (Withdrawn) The rollerbar mechanism of claim 12 wherein said elongated metal rod is resilient when supported by said mount at an upward angle to said horizontal base, wherein said elongated metal rod forms a bow between said mount and said support.

14. (Withdrawn) The rollerbar mechanism of claim 13 further comprising a switch disposed between said end cap and said support, wherein said switch is depressible when said rod is flexed.

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15. (Withdrawn) The rollerbar mechanism of claim 12 wherein said elongated rod is made of stainless steel.

16. (Withdrawn) The rollerbar mechanism of claim 12 wherein said sleeve extends approximately 3/4^{ths} of the way along said rod.

17. (Withdrawn) The rollerbar mechanism of claim 12 wherein said sleeve has a matte surface.

18. (Withdrawn) The rollerbar mechanism of claim 12 wherein said sleeve has a texturized surface.

19. (Withdrawn) The rollerbar mechanism of claim 12 wherein a first portion of said sleeve has a hard shiny surface and a second portion of said sleeve has a texturized surface.

20. (Withdrawn) The rollerbar mechanism of claim 13 further comprising a tension adjusting apparatus disposed adjacent to said mount

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wherein said elongated rod lies on said tension adjusting apparatus, said tension adjusting apparatus operative to alter said upward angle.

21. (Withdrawn) The rollerbar mechanism of claim 13 wherein said upward angle ranges between 1/2° and 3°.

22. (Withdrawn) The rollerbar mechanism of claim 13 wherein said upward angle is 2°.

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23. (Withdrawn) A cursor positioning device implemented with a movable surface monitored by an optical sensor, said cursor positioning device incorporating a keyboard support structure comprising:

a horizontal base to support said cursor replacement device and said keyboard support structure; and

an approximately level horizontal surface for supporting a keyboard, said horizontal surface forming an upper surface of said keyboard support structure and elevated a selected distance above said horizontal base.

24. (Withdrawn) The cursor positioning device of claim 23 wherein said selected distance is selected to place the level of a keyboard space bar of said keyboard placed on said horizontal surface greater than 2mm above said movable surface.

25. (Withdrawn) The cursor positioning device of claim 23 wherein said movable surface is a rollerbar.

26. (Withdrawn) The cursor positioning device of claim 25 wherein said rollerbar sits at a height of approximately 32mm above said horizontal base.

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27. (Withdrawn) A cursor-positioning device having limited horizontal traversal capability adapted to compensate for reaching a horizontal limit, comprising a compensation mechanism comprising:

a horizontal tracking module to receive horizontal cursor-positioning information and transmit said horizontal cursor-positioning information on a communications link;

a horizontal limit detector activated when said cursor positioning device reaches a limit of horizontal traverse;

a suspension-of-tracking module activated by activation of said horizontal limit detector and adapted to suspend operation of said horizontal tracking module; and

a resumption-of-tracking module adapted to unsuspend said horizontal tracking module after a specified period, wherein during said specified period, said cursor-positioning device may be positioned away from said horizontal limit without affecting a cursor position.

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28. (Withdrawn) The cursor-positioning device of claim 27 wherein operation of said compensation mechanism is optional.

29. (Withdrawn) A pointing device for use with a keyboard, said pointing device functioning as a computer mouse comprising:

a horizontal base to support said pointing device adjacent to said keyboard;

an enclosure incorporating a plurality of apertures, said enclosure mounted across a width of a portion of said horizontal base;

a rollerbar, capable of rotation and translation, mounted within said enclosure, a portion of said rollerbar available for manipulation through a first aperture of said plurality of apertures;

a plurality of function keys disposed proximate to said rollerbar in said enclosure, said plurality of function keys available for manipulation through a subset of said plurality of apertures;

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a sensor disposed adjacent to said rollerbar and adapted to monitor the rotation and translation of said rollerbar; and

a connection to a serial communication facility carrying information about movement of said rollerbar and a state of said plurality of function keys, said connection implemented within said enclosure.

30. (Withdrawn) The pointing device of claim 29 further comprising a switch mounted in said enclosure proximate to said rollerbar, wherein said rollerbar is further adapted to be depressible, said switch disposed to be activated when said rollerbar is depressed.

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31. (Withdrawn) The pointing device of claim 29 wherein said rollerbar further comprises:

an inner rod; and

a sleeve disposed around said inner rod to slide freely and rotate about said inner rod, said outer sleeve covering a portion of said inner rod.

32. (Withdrawn) The pointing device of claim 31 wherein said sleeve is sufficiently long to always be in said first aperture.

33. (Withdrawn) The pointing device of claim 31 wherein said sleeve is formed of a material having a matte finish.

34. (Withdrawn) The pointing device of claim 31 wherein said sensor is an optical sensor focussed on said sleeve at an angle perpendicular to an axis of said rollerbar.

35. (Withdrawn) The pointing device of claim 31 wherein said sensor comprises an image captures device that captures images of said sleeve

at set times and determines the motion of said rollerbar by computations based on said images.

36. (Withdrawn) The pointing device of claim 34 wherein said optical sensor is mounted beneath said rollerbar focussed on said sleeve above said optical sensor.

37. (Withdrawn) The pointing device of claim 34 wherein a focus of said optical sensor is midway between a normal height of said sleeve and a maximum depression of said sleeve.

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38. (Withdrawn) The pointing device of claim 34 wherein said optical sensor is mounted on a right-hand side of said enclosure focused on said sleeve of said rollerbar and is located at approximately a minimum deflection point of said sleeve.

39. (Withdrawn) The pointing device of claim 29 wherein said plurality of function keys comprises three function keys.

40. (Withdrawn) The pointing device of claim 29 wherein a correspondence between said plurality of function keys and mouse buttons is configurable.

41. (Withdrawn) The pointing device of claim 29 further comprising a scroll wheel disposed among said function keys.

42. (Withdrawn) The pointing device of claim 29 wherein said serial communication facility is a PS/2 bus.

43. (Withdrawn) The pointing device of claim 29 wherein said serial communication facility is a USB connection.

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44. (Withdrawn) The pointing device of claim 41 further comprising a pass-through capability allowing a PS/2 connection to said serial communication facility.

45. (Withdrawn) A mouse replacement device adapted for concurrent connection of a PS/2 positioning device comprising:

a primary bi-directional serial connection to a computer using an Intellimouse protocol;

a pass-through module adapted to pass PS/2 equivalents of data on said primary bi-directional serial connection to an output port; and

a logic module adapted to OR signals from said mouse replacement device and said output port onto a return channel of said primary bi-directional serial connection.

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46. (Withdrawn) The mouse replacement device of claim 45 further comprising a protocol conversion module disposed between said primary bi-directional serial connection and said pass-through module.

47. (Withdrawn) The mouse replacement device of claim 46 wherein said primary bi-directional serial connection operates on a USB port.

48. (Previously presented) The optical assembly of claim 7 wherein said optical sensor moves with said surface maintaining a constant distance and orientation to said surface.

49. (Withdrawn) The pointing device of claim 30 wherein said rollerbar further comprises:

an inner rod; and

a sleeve disposed around said inner rod to slide freely and rotate about said inner rod, said outer sleeve covering a portion of said inner

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rod, wherein said sensor is an optical sensor focussed on said sleeve at an angle perpendicular to an axis of said rollerbar and said sensor is adapted to move with said rollerbar maintaining a constant distance and orientation to said sleeve.

50. (New) A cursor control device comprising:

a base;

a support mechanism supported on said base;

a target comprising a surface movably mounted on said support mechanism to present a varying segment of said surface to a focus area; and

an optical sensor comprising a sensing component, said sensing component mounted facing said surface of said target at said focus area, wherein said optical sensor detects a change in position of said surface.

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51. (New) The cursor control device of claim 50, wherein the support mechanism comprises a member extending from a first end to a second end.

52. (New) The cursor control device of claim 50, wherein the support mechanism comprises a member extending from a support element at a first end to a support element at a second end.

53. (New) The cursor control device of claim 50, wherein the support mechanism comprises a member extending from a support element at a first end to a spring member at a second end.

54. (New) The cursor control device of claim 50, wherein the support mechanism comprises a member extending from a mount at a first end to a switch mechanism at a second end; the support member disposed for

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reciprocal translation having a vertical component into and out of contact with the switch mechanism.

55. (New) The cursor control device of claim 50, wherein the surface is rollably supported by said support mechanism.

56. (New) The cursor control device of claim 50, wherein the surface is rollably supported by a bearing mechanism on said support mechanism.

57. (New) The cursor control device of claim 50, wherein the surface is translatably supported by said support mechanism.

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58. (New) The cursor control device of claim 50, wherein the surface is translatably supported by a bearing mechanism on said support mechanism.

59. (New) The cursor control device of claim 50, wherein the surface comprises a sleeve rotatable via a bearing mechanism around the support mechanism and translatable along the support mechanism, rotation and translation of the sleeve being interpretable by the sensor.

60. (New) The cursor control device of claim 50, wherein the surface has a matte texture.

61. (New) The cursor control device of claim 50, wherein the surface is texturized.

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